Docket No.: 231753US26YA

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

RE: Application Serial No.: 10/673,506
Applicants: Eric J STRANG
Filing Date: September 30, 2003
For: SYSTEM AND METHOD FOR USING FIRST-
PRINCIPLES SIMULATION TO ANALYZE A
PROCESS PERFORMED BY A SEMICONDUCTOR
PROCESSING TOOL
Group Art Unit: 2825
Examiner: Vuthe Siek

SIR:

Attached hereto for filing are the following papers:

STATEMENT OF SUBSTANCE OF THE INTERVIEW

Our credit card payment form in the amount of **$0.00** is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Steven P. Weihrouch
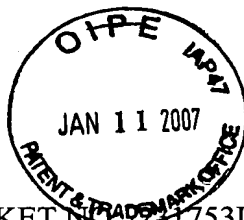Registration No. 32,829

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :

ERIC J STRANG : EXAMINER: SIEK, VUTHE

SERIAL NO: 10/673,506 :

FILED: SEPTEMBER 30, 2006 : GROUP ART UNIT: 2825

FOR: SYSTEM AND METHOD FOR :
USING FIRST-PRINCIPLES
SIMULATION TO ANALYZE A PROCESS
PERFORMED BY A SEMICONDUCTOR
PROCESSING TOOL

STATEMENT OF SUBSTANCE OF INTERVIEW

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

Following the interview on January 4, 2007, please find enclosed for the above-

identified application as follows:

Statement of Substance of Interview beginning on page 2 of this paper.

Statement of Substance of Interview

In the outstanding Office Action, Claims 1-69 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting over Claims 1-44, 1-58, 1-48, 1-78, and 1-62 of co-pending Application Nos. 10/673,138; 10/673,467; 10/673,501; 10/673,507; 10/673,583; and 10/673,583, respectively. Claims 1-25, 32-56 and 63-69 were rejected under 35 U.S.C. § 103(a) as being obvious over <u>Sonderman et al</u> (U.S. Pat. No. 6,802,045) in view of <u>Kee et al</u> (U.S. Pat. No. 5,583,780). Claims 26-31 and 57-59 were rejected under 35 U.S.C. § 103(a) as being unpatentable over <u>Sonderman et al</u> and <u>Kee et al</u> in view of <u>Fatke et al</u> (U.S. Pat. Appl. No. 200510016947).

As discussed during the interview, Claim 1 as clarified in the October 26, 2006 filed amendment defines a method for analyzing a process performed by a semiconductor processing tool including:

> 1) inputting process data relating to an actual process being performed by the semiconductor processing tool,
> 2) inputting a first principles physical model including a set of computer-encoded differential equations, the first principles physical model describing at least one of a basic physical or chemical attribute of the semiconductor processing tool,
> 3) performing a first principles simulation for the actual process being performed ***during performance of the actual process*** using the physical model to provide a first principles simulation result in accordance with the process data relating to the actual process being performed in order to simulate the actual process being performed; and
> 4) using the first principles simulation result ***obtained during the performance of the actual process*** to determine a fault in the actual process being performed by the semiconductor processing tool.[1]

As discussed during the interview, the most relevant section of <u>Sonderman et al.</u> specifically discloses at col. 9, lines 46-51, that:

> The system 100 then optimizes the simulation (described above) ***to find more optimal process target*** (T_i) for each silicon wafer, S_i ***to be processed***. These target values are then used ***to generate new control inputs***, X_{Ti}, on the line 805 to control ***a subsequent process*** of a silicon wafer S_i. The ***new control***

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[1] The enumerations have been added purely for the purpose of referencing these elements for discussion.

> *inputs*, X_{Ti}, are generally based upon a plurality of factors, such as simulation data, output requirements, product performance requirements, process recipe settings based on a plurality of processing tool 120 operating scenarios, and the like. [emphasis added]

This section of Sonderman et al. clearly discloses that the simulation is to find a more optimum process target for each silicon wafer *to be processed*. The simulation results produce a new control input for the silicon wafer *to be processed*.

Thus, Applicant respectfully submits that Sonderman et al. teach performing first principles simulation for the actual process being performed before performance of the actual process, and *not* the claimed performing first principles simulation for the actual process being performed during performance of the actual process. Thus, Sonderman et al. do not disclose and indeed *teach away* from the present invention. For at least this reason, Applicant resubmits that the present invention patentably defines over Sonderman et al.

Other sections of Sonderman et al. relevant to a first principles simulation being performed for an actual process indicate at col. 7, lines 3-6, that a simulation result is used to "emulate the operations of an actual process control environment" and at col. 3, lines 56-63, that the "process control environment 180 can receive data from the manufacturing environment 170 and the simulation environment 210 and make appropriate changes to manufacturing control parameters to affect operations of the manufacturing environment 170." These disclosures however, do not indicate when the simulation is performed.
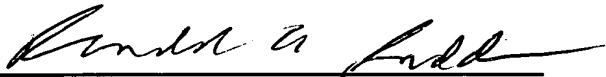
Thus, when considered as a whole Sonderman et al. do not disclose those features of the present invention upon which the Office relies on for a showing of obviousness.

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Application No. 10/673,506
Statement of Substance of Interview

Finally, aspects of the present invention related to Applicant's Figure 3 were

discussed during the interview. No agreement on patentability was reached.

Respectfully submitted,

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